

Delivering brief physical activity interventions in primary care: a systematic review of the prevalence, and factors associated with delivery, receipt, and patient receptivity

ABSTRACT

Background

Brief interventions (BI) involving physical activity (PA) screening and/or advice are recommended in primary care. However, the frequency of delivery is unknown.

Aim

To examine the extent to which PA BI are delivered in primary care and explore factors associated with delivery, receipt, and patient receptivity.

Design

A mixed methods systematic review, with a narrative synthesis of results.

Method

CINAHL, EMBASE, MEDLINE and PsychInfo were searched from January 2012 until June 2020 for qualitative and quantitative studies reporting the level of delivery and/or receipt of PA BI within primary care, and/or factors affecting delivery, receipt, and patient receptivity. Quality was assessed using the Mixed Methods Appraisal Tool. Attitudes and barriers towards delivery were coded into the Theoretical Domains Framework and the Capabilities-Opportunities-Motivation Behaviour model.

Results

After screening 13066 records, 66 articles were included. The extent of PA screening and advice in primary care varied widely (2.4% – 100%; 0.6% - 100%, respectively). PA advice was delivered more often to patients with a higher body mass index, lower PA levels, and/or more comorbidities. Barriers including a lack of time and training/guidelines remain, despite recommendations from the World Health Organisation and National Institute for Health and Care Excellence. Few studies explored patients' receptivity to advice.

Conclusion

PA BI are not delivered frequently or consistently within primary care. Addressing barriers to delivery through system-level changes and within training programmes could improve and increase the advice given. Understanding when patients are receptive to PA interventions could enhance healthcare professionals' confidence in their delivery.

1 **Keywords**

2 Primary care, Physical activity, Brief interventions, Health promotion, Disease
3 prevention, Systematic review

4

5 **How this fits in**

6 *(Summarise, in no more than four short sentences, what was previously known or*
7 *believed on the topic and what your research adds, particularly focusing on the*
8 *relevance to clinicians.)*

9 Brief physical activity (PA) interventions delivered in primary care
10 consultations can increase PA in the general population. However, there is a
11 lack of understanding regarding the frequency and factors associated with
12 delivery. This review reports high variation in the frequency and context of
13 delivery and receipt and outlines common barriers and facilitators (coded
14 within the TDF and COM-B model) to practitioner delivery. Identified barriers
15 could be addressed through system-level changes, improved educational
16 resources, and in practitioner training, to increase practitioner knowledge and
17 confidence, and subsequently improve patient receptivity and PA uptake.

18

1 INTRODUCTION

2 Physical inactivity is a global public health problem[1, 2]. In the UK, levels of
3 inactivity are increasing; approximately 32% of men, and 36% of women failed
4 to meet the government's physical activity (PA) recommendations in 2018[3].
5 Physical inactivity increases the risk of poor physical and mental health, is
6 estimated to account for as many deaths in the UK as smoking (one in six),
7 and costs the NHS around £0.9 billion annually[4].

8 The World Health Organisation's (WHO) global recommendations on PA for
9 health suggest PA advice should be provided within primary care[5].

10 Correspondingly, within the UK the National Institute for Health and Care
11 Excellence (NICE) recommends that primary care practitioners should deliver
12 'brief' PA advice to patients who are not currently meeting PA guidelines[6].
13 NICE defines brief advice as, "verbal advice, discussion, negotiation or
14 encouragement, with or without written or other support or follow-up"[6].

15 Previous reviews have found brief interventions (BI) to be effective at
16 increasing (self-reported) PA in the short-term, with some evidence that this
17 can be maintained in the longer term (12 months)[7, 8]. However, barriers to
18 giving and receiving PA advice in primary care are rife: a review in 2012
19 reported a variety of barriers including lack of resources and perceived
20 (in)effectiveness of advice[9]. Since that review was published, population PA
21 levels have not substantially increased[10], despite various initiatives
22 nationally and globally to increase PA advice delivered in primary care[11, 12].
23 Additionally, the UK's recent GP workforce 'crisis'[13, 14] may have impacted
24 GPs' capacity to include PA discussions within consultations. Thus, an
25 updated review on barriers and facilitators to PA advice in primary care is
26 warranted. Furthermore, little is known about how often, and to who, this
27 advice is given. This knowledge is crucial for understanding how BI for PA are
28 implemented in practice, and identifying potential areas for improvement.

29 The aim of this mixed methods systematic review was to examine the extent
30 to which brief PA interventions (PA screening and/or advice) are delivered in
31 primary care and explore factors associated with delivery, receipt, and patient
32 receptivity.

1 **METHODS**

2 **Search strategy**

3 We searched for quantitative articles reporting level of delivery and/or receipt
4 of brief PA interventions within primary care consultations for health
5 promotion/disease prevention, and quantitative/qualitative articles reporting
6 factors affecting delivery, receipt, and patient receptivity. In July 2018, and
7 again in July 2020, separate searches were carried out by an information
8 specialist in CINAHL, EMBASE, MEDLINE, and PsychInfo (Supplementary
9 Box S1 for example search terms). The review was prospectively registered
10 on PROSPERO (CRD42018103812).

11 **Article selection and data extraction**

12 Two authors (RJT, LHH) screened the titles and abstracts using the inclusion
13 criteria (Supplementary Box S2), erring on the side of inclusion. Three authors
14 (RRS, LHH, AG) reviewed 20% of the titles and abstracts to ensure reliability.
15 20% of the full texts were double screened by LHH and AG, with
16 disagreements arbitrated by RJB. References of included articles were hand
17 searched for additional eligible studies.

18 One-hundred per cent of the data were extracted in duplicate by independent
19 authors (LHH, AG, RJT, RRS), using an electronic spreadsheet.

20 Discrepancies were checked by a third reviewer. Key study characteristics are
21 listed in Supplementary Table 1, and the main outcomes of patient and
22 practitioner receipt/delivery of PA BI in Supplementary Tables 3 and 4.

23 **Quality assessment**

24 Study quality was assessed using the Mixed Methods Appraisal Tool[15] by
25 LHH, with 20% checked by AG.

26 **Analysis**

27 To examine the extent to which PA BI are delivered in primary care,
28 quantitative data were extracted on the reported frequency of 1) PA screening,
29 2) delivery of PA advice by HCPs and 3) patient-reported receipt of PA BI. A

1 quantitative synthesis of this data was not possible due to large heterogeneity
2 in the definition and measurement of PA BI. A narrative synthesis was
3 therefore conducted.

4 To explore factors associated with delivery, receipt, and patient receptivity,
5 quantitative data were extracted inductively from articles, in duplicate by LHH,
6 AG, RJT, RRS, and coded as either patient or HCP/system factors.

7 Qualitative data on HCP attitudes and perceived barriers towards delivery,
8 and patients' views, attitudes, and receptivity towards PA BI were extracted
9 inductively from the articles using the articles' own phrasing/codes. Similar
10 codes were grouped together by LHH (expertise in behaviour change theory).
11 Codes relating to HCP attitudes or barriers were mapped onto the Theoretical
12 Domains Framework (TDF) and Capabilities-Opportunities-Motivation
13 Behaviour model (COM-B) by LHH and RJB, to assist identification of key
14 components for future interventions aiming to increase PA BI delivery.

15

16 **RESULTS**

17 The database searches identified 13,066 records once duplicates were
18 removed (Figure 1), with 59 eligible articles. Hand searching references
19 identified seven further studies, giving a total of 66 papers. The majority of
20 studies collected data from healthcare professionals (HCPs; n=39), used
21 cross-sectional surveys (n=52), and were American (n=20) (Supplementary
22 Table 1).

23 **Quality Assessment**

24 The majority of studies were moderate quality. Most quantitative descriptive
25 studies used appropriate statistical analyses (94%), and appropriate
26 measurements (81%), many of which were pilot tested and/or developed
27 using Delphi methods, or in consultation with key stakeholders
28 (Supplementary Table 2). The risk of nonresponse bias, and the
29 representativeness of the target population was unclear, or inadequate, in
30 around half of these studies.

1 **Level of PA screening by HCPs**

2 Eleven studies reported the level of PA screening by practitioners (Figure 2;
3 Supplementary Table 3). Data from medical chart audits in medium-high
4 quality studies ($n=6$) reported that the proportion of patients who had their PA
5 levels assessed ranged from 2.4% to 60.1% (median=43.5%)[16, 17]. The
6 proportion of practitioners who reported assessing PA for at least some of
7 their patients ranged from 8% to 100% (median=50%)[18,19].

8 **Level of brief PA advice by HCPs**

9 Thirty-one studies reported the extent to which practitioners provide PA
10 advice or counselling (Figure 2; Supplementary Table 3). The proportion of
11 practitioners who reported delivering PA advice/counselling ranged from 0.6%
12 to 100% (median=64%)[19]. One high quality study analysed audiotaped
13 consultations and reported that PA was discussed in 72% of patient visits[20,
14 21]. In contrast, the proportion of patients who were given PA
15 advice/counselling, as determined by medical chart audit (in one high quality
16 study), ranged from 1.5% to 52.2% (median=23.3%)[16].

17 **Patient reported receipt of PA BI**

18 Twenty-five studies provided data on patient receipt of PA BI (Figure 2;
19 Supplementary Table 4). The proportion of patients reporting that they had
20 received PA advice ranged from 7.7% to 76% (median=35%)[22, 23], with
21 thirteen studies reporting fewer than 40% of patients recalled receiving PA
22 advice.

23 **Factors associated with the delivery or receipt of PA BI**

24 **Patient factors**

25 Twenty-three studies examined patient factors associated with PA BI
26 (Supplementary Table 5). While the majority of evidence was mixed and
27 inconclusive, the following patient factors were most consistently reported to
28 be significantly and positively associated with the delivery or receipt of PA BI:
29 high patient BMI ($n=11$), physically inactive/sedentary patients ($n=5$), patients
30 with poorer health/more comorbidities ($n=5$), and patients who had more

1 physician visits ($n=3$). Patient gender and age was often found *not* to be
2 associated with PA BI ($n=11$; $n=6$, respectively).

3 **HCP/system-related factors**

4 Twenty-four studies examined practitioner/system factors associated with PA
5 BI (Supplementary Table 6). The majority of findings were inconsistent,
6 except: female practitioners were more likely than male practitioners to
7 assess PA (but not necessarily advise)[16, 24-27]; practitioners with higher
8 levels of PA themselves[26, 28-30] and practitioners with positive beliefs
9 about their capabilities and/or efficacy[16, 25, 26, 31] were more likely to
10 deliver PA BI.

11 **HCP attitudes and perceived barriers towards PA BI**

12 Twenty-six quantitative and two qualitative studies[32, 33] examined HCP
13 attitudes towards delivering PA BI. These were coded into the TDF[34] and
14 COM-B[35] (Supplementary Table 7).

15 1. *Capabilities (psychological)*. Twenty quantitative and one qualitative study
16 reported barriers and facilitators that were coded under psychological
17 capabilities. Nineteen of these reported attitudes that fit within the TDF
18 'knowledge'. In 12 of these, HCPs reported a personal lack of knowledge
19 or training as a barrier to providing PA BI, with a request for additional
20 training mentioned[36]. However, the majority of HCPs in 6 studies
21 perceived they had sufficient knowledge or skills. In 2/4 studies that were
22 coded under the TDF 'skills', practitioners reported difficulty in advising
23 patients, or including it in their appointments[25, 37].

24

25 2. *Opportunity (physical)*. Seventeen studies (including two qualitative studies)
26 measured attitudes that were coded under the TDF 'Environmental context
27 and resources', and the COM-B 'Physical opportunity' categories. The most
28 commonly cited barriers within these themes were perceived time
29 constraints for including PA discussions within consultations ($n=17$) and a
30 perceived lack of local services or places to refer patients ($n=8$). Further
31 barriers included perceived (lack of) availability of educational resources for

1 HCPs and (lack of) effective tools/information to give to patients, along with
2 perceived (lack of) opportunities to follow-up on PA advice.

3

4 3. *Motivation (reflective and automatic)*. The most commonly coded TDF
5 category within Motivation was 'Beliefs about consequences' (n=19). Within
6 this domain, the most commonly reported barriers to delivery PA BI were;
7 HCP perceived (lack of) patient interest, motivation, or likelihood of
8 adhering to advice(n=14), HCP perceived patient expectation of receiving
9 pharmacological treatment(n=6), and HCP perceived (lack of) effectiveness
10 of PA advice(n=7). Despite these barriers, most practitioners thought that
11 PA BI were a part of their role(n=11), important(n=7), and the majority felt
12 confident about their capabilities (self-efficacy) in providing PA BI and
13 supporting behaviour change(n=8/13 studies).

14 **Patients' views, attitudes, and receptivity towards brief PA interventions**

15 Four high quality qualitative studies explored patient views and attitudes
16 towards PA advice in primary care[38-41]. Patients felt they had no regular
17 conversations about PA, and that PA conversations lacked substance. The
18 need for a patient-centred approach, with follow-up communication was
19 mentioned. Some patients were receptive to PA advice if clearly linked to
20 contextual factors, such as the potential to reduce medication or pain. Some
21 patients believed practitioners lack the confidence and knowledge to deliver
22 PA BI, which influenced their receptivity towards advice. However, provider
23 motivation and support were viewed as important for behaviour change.

24 **DISCUSSION**

25 **Summary**

26 This mixed-methods review of 66 studies worldwide suggests high variation in
27 the extent to which PA is discussed with patients in primary care (PA
28 screening: 2.4% – 100%; PA advice: 0.6% - 100%). Key practitioner barriers
29 included a lack of time, training/guidelines, and perceived patient
30 motivation/adherence to PA advice. Few studies have explored patients'

1 receptivity to such advice, however conversations with clear relevance to the
2 patient's contextual factors (e.g. medication) appear to be valued.

3 **Comparison with existing literature**

4 This review provides an update of the literature on provider and patient
5 barriers to delivering/receiving PA advice, following Campbell et al's (2012)
6 review[9]. It extends their work through coding provider attitudes and barriers
7 into the TDF and COM-B model. Similar provider barriers were identified;
8 perceived likelihood of patient uptake, lack of resources (time, materials), and
9 HCP confidence and knowledge. Lamming et al's (2017) umbrella review also
10 reported time as a key practitioner barrier[7]. It is notable that these barriers
11 remain despite an increased awareness of the importance of PA, and
12 recommendations from WHO and NICE[5, 6]. There is a clear need to identify
13 meaningful ways to tackle these persistent challenges.

14 Comparing PA to other behaviour change discussions, diet, weight, and
15 smoking is often discussed more frequently than PA, whereas alcohol is
16 discussed less[42-49]. Furthermore, a survey in Sweden and the US reported
17 that more patients wanted to receive support on diet, weight, and smoking
18 than PA. Therefore PA discussions could be conducted alongside advice on
19 diet and/or weight to increase delivery frequency and patient receptivity.

20 **Implications for practice**

21 PA BI were more frequently delivered to patients with higher BMIs, a greater
22 number of comorbidities, and who were physically inactive. Patients believed
23 that their practitioners' perception of their activity levels and physical
24 capabilities influenced their likelihood of receiving advice. Practitioners must
25 therefore be cautious not to stigmatise patients when deciding when and how
26 to conduct these conversations: if the patient feels they are being stigmatised
27 it could have detrimental effects on their psychological and physical health[50]
28 and may increase inactivity[51].

29 Patients often under-reported receiving PA advice, suggesting that focussed
30 HCP training on delivery skills may be needed to increase patient

1 engagement with advice. Opportunistic PA BI tailored to what is realistically
2 feasible around their lifestyles are likely to be most effective.

3 The parallels between HCP perceived barriers to BI for PA compared with
4 smoking cessation[52] and obesity[53], notably time constraints, lack of
5 experience, and lack of patient motivation, suggests a cultural shift is
6 desirable, to address HCP placing preventative lifestyle interventions as lower
7 priorities compared with disease management (including
8 pharmacotherapy)[54]. Whilst any attempts to address the physical inactivity
9 epidemic are multifaceted with a need to engage all stakeholders, primary
10 care HCP have a key role owed to the high frequency of patient contact[55]
11 coupled with the trust patients put in HCP[56].

12 To address this challenge, HCP, particularly GPs, need evidence to realise
13 that behavioural interventions have an important place in holistic patient-
14 centred evidence-based medicine, with reassurance that patients will engage
15 with and benefit from them. HCP also need clear interventions to offer, with
16 education at undergraduate and postgraduate level and made essential in
17 continuing professional development. The recently launched UK's 'Moving
18 Medicine' toolkit[57] may help overcome knowledge and resource barriers.
19 However, a recent study demonstrated that despite educational training
20 successful addressing GPs' barriers to providing opportunistic weight loss
21 interventions during a trial, after the trial ended, GPs reported the same
22 barriers as pre-trial[58]. Therefore, wider system changes may also be
23 required.

24 25 **Implications for research**

26 There is limited research on patient views towards receiving PA interventions
27 in primary care. Three of the four studies in this review were limited to
28 samples of adults aged 60+ living in North America[38, 39, 41]. Research is
29 needed on patient receptivity towards PA discussions within the UK, amongst
30 a wider age-range, to inform practitioner training and increase patient
31 engagement with advice.

1 Only four studies were UK-based[44, 59-61], and all indicated that rates of PA
2 BI are low: 15% of GPs reported delivering PA advice to all patients, 18% - 35%
3 of patients reported receiving advice, and 53% of patients reported PA
4 screening. More research is needed in the UK to better understand the
5 prevalence, factors associated with, and barriers and enablers to
6 delivering/receiving PA BI in UK primary care.

7 Current research fails to adequately describe the content of PA interventions,
8 thus, we are unable to comment on the quality of advice given. Future
9 research would benefit from describing the BI and the context in which it is
10 delivered, using the Behaviour Change Taxonomy[62] and TIDIER
11 checklist[63].

12 **Strengths and Limitations**

13 This review is the first to report on the prevalence of PA BI in primary care,
14 and link HCP perceived barriers and facilitators to the COM-B and TDF.

15 Only articles written in English were included, due to a lack of translation
16 resources. Only 20% of article screening and quality assessment was
17 conducted in duplicate. Only peer-reviewed, published articles were included,
18 therefore a publication bias may be present. This review focuses solely on PA
19 screening and advice: we excluded studies that examined specific exercise
20 referral schemes or prescriptions (including social prescribing). Future
21 research may benefit from comparing the frequencies of these. Due to a lack
22 of detail within the articles, we were unable to code BCTs, despite planning to
23 in our protocol. The large heterogeneity of outcome measures made cross-
24 study and cross-cultural comparisons challenging.

25 The quality of studies were often reduced by the sample not being
26 representative of the target population (or lack of detail to assess this), and a
27 high risk of non-response bias. Therefore caution should be taken when
28 generalising findings. It is possible, especially in the HCP sample that those
29 with a particular interest in PA were more likely to participate. Therefore the
30 prevalence of PA BI reported in this review may be an overestimation.

31

1 **CONCLUSION**

2 Prevalence of the delivery and receipt of PA BI within primary care varies
3 widely, with many studies reporting low levels of delivery/receipt. HCPs have
4 identified a number of barriers to delivering PA advice, including time,
5 knowledge, and confidence. Addressing these barriers through system-level
6 changes and training programmes could improve the consistency, quality, and
7 frequency of advice given. A better understanding of when patients are most
8 receptive to PA interventions within primary care could enhance the
9 effectiveness of interventions and increase HCPs confidence to discuss PA
10 with their patients.

11

1 **Figure 1. Flow diagram of search strategy**

2

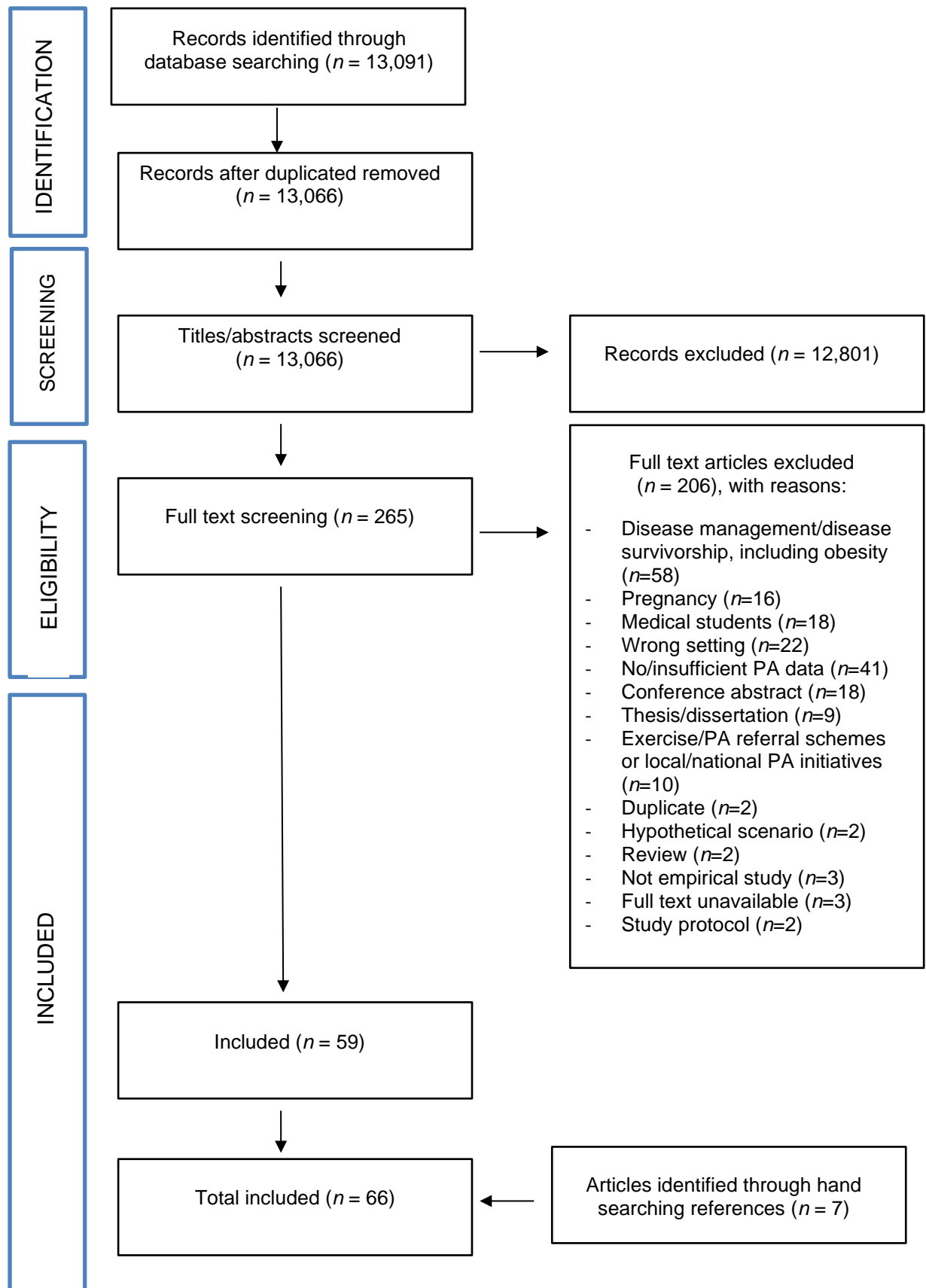
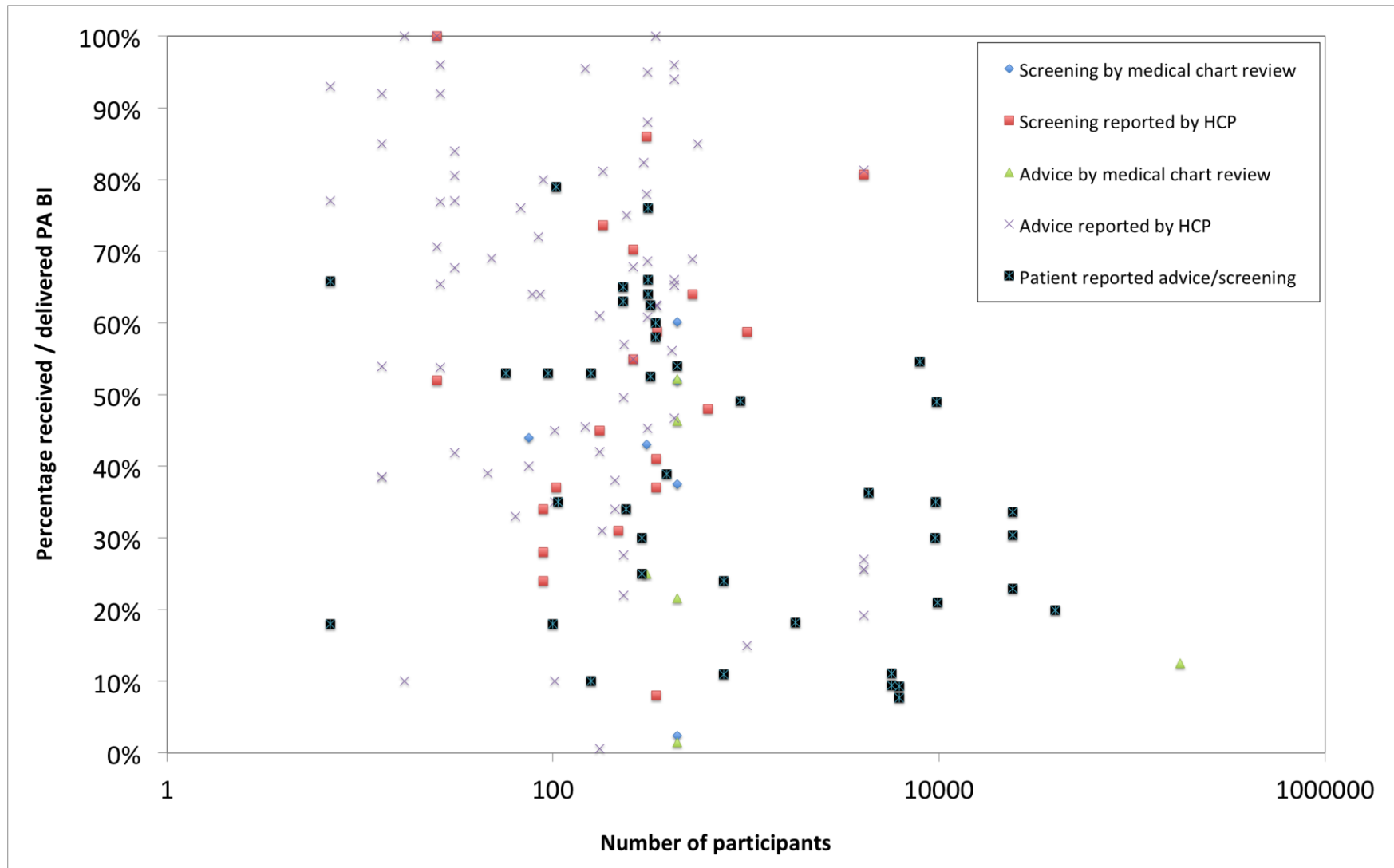


Figure 2. Frequency of physical activity brief interventions in primary care.



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Ethical Approval

Not required as not an empirical study.

Competing Interests

The authors have no competing interests to declare.

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